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Time-Dependent XAS Studies of Trapped Enzyme-Substrate Complexes of Alcohol Dehydrogenase from *Thermoanaerobacter brockii*

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ABSTRACT: The understanding of structure-function relationships in proteins has been significantly advanced with the advent of the biotechnological revolution. A goal yet to be realized for many metalloenzyme systems is to characterize the dynamic changes in structure that bridge the static endpoints provided by crystallography. We present here a series of edge and EXAFS spectra of the metalloenzyme alcohol dehydrogenase from *Thermoanaerobacter brockii* (TbADH) complexed with its substrate. The enzyme-substrate complexes were trapped by fast freezing at various times, following their enzyme activity. Our edge and EXAFS analysis both reveal the time-dependent changes in the structure of the active site of TbADH.